

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) A semiconductor device comprising:
a wide-gap bipolar semiconductor element using a wide-gap semiconductor having stacking faults resulting from basal plane dislocation, and having a built-in voltage in the forward direction,

a semiconductor package accommodating said wide-gap bipolar semiconductor element and having electrical connection means for connecting said wide-gap bipolar semiconductor element to external apparatuses, and

heating means for heating said wide-gap bipolar semiconductor element inside said semiconductor package at a temperature of ~~125°C~~ 50°C or more.

2- 4. (Canceled)

5. (Currently Amended) A semiconductor device in accordance with claim 1, wherein said ~~heating means~~ means for heating heats said wide-gap bipolar semiconductor element to a predetermined temperature higher than ~~125°C~~ 50°C in advance before the start of the operation of said wide-gap bipolar semiconductor element.

6. (Canceled)

7. (Currently Amended) A semiconductor device in accordance with claim 1, wherein said ~~heating means~~ means for heating is an electric heater ~~provided~~ providing heat to said wide-gap bipolar semiconductor element.

8. (Currently Amended) A semiconductor device in accordance with claim 1, wherein said ~~heating means~~ means for heating is a heat sink that raises the temperature of said wide-gap bipolar semiconductor element to ~~125°C~~ 50°C or more by controlling a radiation of heat generated when said wide-gap bipolar semiconductor element is energized.

9. (Canceled)

10. (Currently Amended) A semiconductor device in accordance with claim 1, wherein said semiconductor package has a temperature sensor for detecting the temperature of said wide-gap bipolar semiconductor element and a temperature controller that keeps the temperature of said wide-gap bipolar semiconductor element at the temperature of ~~±25°C~~ 50°C or more on the basis of a detection output of said temperature sensor.

11. (Previously Presented) A semiconductor device in accordance with claim 1, wherein said wide-gap bipolar semiconductor element is either a diode having a pn junction or a self-excited thyristor.

12 - 17. (Canceled)

18. (Currently amended) A semiconductor device comprising:
a wide-gap bipolar semiconductor element using a wide-gap semiconductor having stacking faults resulting from basal plane dislocation, and having a built-in voltage in the forward direction,

a semiconductor package accommodating said wide-gap bipolar semiconductor element and having electrical connection means for connecting said wide-gap bipolar semiconductor element to external apparatuses,

~~heating~~ means for heating said wide-gap bipolar semiconductor element inside said semiconductor package at a temperature of ~~±25°C~~ 50°C or more,

a temperature sensor for detecting the temperature of said wide-gap bipolar semiconductor element, and

a temperature controller that keeps the temperature of said wide-gap bipolar semiconductor element at the temperature of ~~±25°C~~ 50°C or more on the basis of a detection output of said temperature sensor.

19. (New) A semiconductor device in accordance with claim 1, wherein the semiconductor package comprises a support made of metal, on which the wide-gap bipolar semiconductor element is mounted.

20. (New) A semiconductor device in accordance with claim 19, wherein the semiconductor package comprises a cap made of metal fixed on the support so as to cover the wide-gap bipolar semiconductor element.

21. (New) A semiconductor device in accordance with claim 19, wherein the wide-gap bipolar semiconductor element is bonded to a upper face of the support, and the means for heating is located on a lower face of the support.

22. (New) A semiconductor device in accordance with claim 19, wherein the wide-gap bipolar semiconductor element is mounted via an insulation plate on the support, and the means for heating is located on a lower face of the support.

23. (New) An operation method for a semiconductor device according to claim 1, comprising steps of:

heating said wide-gap bipolar semiconductor element at a first temperature of 50°C or more and less than 200°C before energization of the wide-gap bipolar semiconductor element;

after a start of the energization, operating the wide-gap bipolar semiconductor element with an applied current smaller than a rated current till the wide-gap bipolar semiconductor element reaches a second temperature of 200°C or more; and

after the wide-gap bipolar semiconductor element has reached the second temperature, allowing the wide-gap bipolar semiconductor element to be applied with a current up to the rated current.

24. (New) An operation method for a semiconductor device according to claim 23, wherein

after the start of the energization, the temperature of the wide-gap bipolar semiconductor element is raised by the means for heating in addition to self-heating of the wide-gap bipolar semiconductor element.

25. (New) An operation method for a wide-gap bipolar semiconductor element using a wide-gap semiconductor having stacking faults resulting from basal plane dislocation, and having a built-in voltage in the forward direction, comprising steps of:

at a start of the energization, operating the wide-gap bipolar semiconductor element with an applied current smaller than a rated current till the wide-gap bipolar semiconductor element reaches a temperature of 200°C or more; and

after the wide-gap bipolar semiconductor element has reached said temperature of 200°C or more, allowing the wide-gap bipolar semiconductor element to be applied with a current up to the rated current.

26. (New) A semiconductor device in accordance with claim 1, wherein said means for heating is a radiant heating section which radiates an infrared ray and/or a far-infrared ray to the semiconductor package so as to heat the wide-gap bipolar semiconductor element.

27. (New) A semiconductor device in accordance with claim 1, wherein said means for heating is of a blowing hot air to the semiconductor package so as to heat the wide-gap bipolar semiconductor element.

28. (New) A semiconductor device in accordance with claim 19, wherein said means for heating is an induction heating apparatus which inductively heats the support made of metal comprised in the semiconductor package so as to heat the wide-gap bipolar semiconductor element.

29. (New) A semiconductor device in accordance with claim 20, wherein said means for heating is an induction heating apparatus which inductively heats the cap made of metal comprised in the semiconductor package so as to heat the wide-gap bipolar semiconductor element.

30. (New) A semiconductor device in accordance with claim 1, wherein the semiconductor package comprises a molded heat-resistant resin so as to encapsulate the wide-gap bipolar semiconductor element.